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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,184	02/15/2002	Naokuni Muramatsu	782 219	9515
25191	7590	07/14/2004	EXAMINER	
BURR & BROWN PO BOX 7068 SYRACUSE, NY 13261-7068			VU, PHUONG T	
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			2841	

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

9/04

Office Action Summary	Application No. 10/077,184	Applicant(s) MURAMATSU ET AL.	
	Examiner Phuong T. Vu	Art Unit 2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2004.
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 39-47 is/are pending in the application.
 4a) Of the above claim(s) 42-45 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 39-41, 46 and 47 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 16 May 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u>6-July-04</u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 39-41, 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayes et al (US 6,380,903 B1) in view of Zhu et al. (US 6,080,012). Regarding claim 39, Hayes shows (Prior Art figures 3A-3B) a connection construction between a planar antenna 30 and a circuit board installed in a wireless device, said planar antenna comprising a planar antenna element 32 and a plurality of elastically deformable pins (tips of 36, 37), the pins are formed by bending a plurality of thin strips 36, 37 projected from the side end of the planar antenna element in substantially vertical direction with respect to the plane of the planar antenna element at a plurality of portions of the side end of the planar antenna element, said circuit board having upper and lower surface planes. Hayes does not teach that said circuit board comprises a plurality of through holes, wherein the planar antenna is electrically and mechanically connected to the circuit board by detachably inserting the elastically deformable pins into the through holes. However, Zhu discloses a circuit board 5 having upper and lower surface planes with planar metallic shield case 4 having elastically deformable pins 43 that are inserted in through holes in the circuit

Art Unit: 2841

board and are electrically and mechanically connected to the circuit board such that the elastically deformable pins do not extend beyond the lower surface plane of the circuit board. The Zhu reference is relied upon solely for this teaching of mechanically and electrically attaching a planar metallic element to a circuit board by inserting elastically deformable pins on the planar metallic element into holes in the circuit board where the elastically deformable pins do not extend beyond the lower surface plane of the circuit board. This method of mounting the planar metallic shield case or any other component to a circuit board as well as other known methods such as mounting through use of frictional force, or solder, screws or other fasteners are art recognized as suitable for an intended purpose. It would have been obvious to those skilled in the art at the time the invention was made to modify the mounting configuration of Hayes which shows mounting pins extending from the metallic element to provide holes in the circuit board as taught by Zhu so that the metallic planar element may be electrically and mechanically connected to the circuit board by inserting the pins of the metallic planar element into the holes of the circuit board to provide an easier, flexible, more reliable and cost effective method of mounting which allows the assembly be more easily maintained and serviced.

Regarding claim 40, Hayes shows that the planar antenna comprises a power supply strip 37 and a short circuit strip 36 formed by bending two thin strips projected from one side end of the antenna element in a substantially vertical direction with respect to the plane of the planar antenna element. Hayes teaches providing pins extending from strips that are elastically deformable by

Art Unit: 2841

bending and are formed at the tip portions of the strips. Zhu also teaches providing pins 43 extending from strips 42 that are elastically deformable by bending and are formed at the tip portions of the strips. Zhu shows that the pins are mechanically and electrically connected to the circuit board ground when inserted into the holes of the circuit board. In the above-mentioned combination, the pins of the antenna element, a power supply spring pin and a short circuit spring pin that are elastically deformable by bending would be formed at tip portions of the power supply strip and the short circuit strip. The antenna system of Hayes inherently comprises a power supply circuit and a short circuit provided on the circuit board. The above mentioned combination would necessarily provide a power supply hole and a short circuit hole each having an inner wall to which a power supply conductive layer and a short circuit conductive layer would connect to the power supply circuit and the short circuit so that the power supply spring pin and the short circuit spring pin are detachably inserted into the power supply hole and the short circuit hole of the circuit board in a bending deformable manner so as to connect mechanically and electrically the planar antenna and circuit board for the antenna assembly to function as intended.

Regarding claim 41, it would have been obvious to provide in the above mentioned combination a planar antenna which comprises a plurality of connection spring pins formed by bending a plurality of thin strips projected from a side end of the planar antenna element in a substantially vertical direction with respect to a plane of the planar antenna element at a plurality of portions of the side end of the planar antenna element other than the portions at which the

Art Unit: 2841

power supply strip and the short circuit strip are formed, said circuit board comprises a plurality of connection holes formed at the portions corresponding to the plural connection spring pins so as to mate with the plural connection spring pins where the power supply circuit, the short circuit, the power supply conductive layer, and the short circuit conductive layer are formed so as to not interfere with the connection of these components wherein the plural connection spring pins of the planar antenna are inserted into the plural connection holes of the circuit board in a bending deformable manner so as to connect mechanically the planar antenna and the circuit board to further secure the planar antenna. Providing additional connection spring pins would provide a more reliable attachment of the antenna to the circuit board.

Regarding claim 46, Hayes teaches that the planar antenna element may be formed from copper or any other known conductive metal compositions. It would have been obvious to those skilled in the art at the time the invention was made that the planar antenna element may be formed from any of the claimed materials as these materials are conductive, resilient, mechanically strong, and cost effective.

3. Claims 39, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayes et al (US 6,380,903 B1) in view of Jones (US 6,338,632B1).

Regarding claim 39, Hayes shows (Prior Art figures 3A-3B) a connection construction between a planar antenna 30 and a circuit board installed in a wireless device, said planar antenna comprising a planar antenna element 32 and a plurality of elastically deformable pins (tips of 36, 37), the pins are formed

Art Unit: 2841

by bending a plurality of thin strips 36, 37 projected from the side end of the planar antenna element in substantially vertical direction with respect to the plane of the planar antenna element at a plurality of portions of the side end of the planar antenna element, said circuit board having upper and lower surface planes. Hayes does not teach that said circuit board comprises a plurality of through holes, wherein the planar antenna is electrically and mechanically connected to the circuit board by detachably inserting the elastically deformable pins into the through holes. However, Jones discloses a circuit board 2 having upper and lower surface planes with a component having elastically deformable pins 1 that are inserted in through holes in the circuit board and are electrically and mechanically connected to the circuit board such that the elastically deformable pins do not extend beyond the lower surface plane of the circuit board. The Jones reference is relied upon solely for this teaching of mechanically and electrically attaching a component to a circuit board by inserting elastically deformable pins on the component into holes in the circuit board where the elastically deformable pins do not extend beyond the lower surface plane of the circuit board. This method of mounting the component to a circuit board as well as other known methods such as mounting through use of frictional force, or solder, screws or other fasteners are art recognized as suitable for an intended purpose. It would have been obvious to those skilled in the art at the time the invention was made to modify the mounting configuration of Hayes which shows mounting pins extending from the component to provide holes in the circuit board as taught by Jones so that the component may be electrically

and mechanically connected to the circuit board by inserting the pins of the metallic planar element into the holes of the circuit board to provide an easier, flexible, more reliable and cost effective method of mounting which allows the assembly to be more easily maintained and serviced.

Regarding claim 47, the inner surfaces of the through holes in the circuit board are free from a brazing material as the pins are held in the holes with a resilient press fit.

Response to Arguments

4. Applicant's arguments filed April 6, 2004 have been fully considered.

Regarding Applicant's request for an interview preceding the submission of the response of April 6, 2004, it is noted that the Examiner works only on a modified part-time schedule. Due to this schedule and other conflicts, it was difficult to schedule the interview at that time. The Examiner apologizes for any inconveniences as a result of this. As noted in Applicant's response, the Examiner left a telephone message with Applicant's representative, Steve Caldwell that the Examiner would be available for an interview on April 6, 2004. Subsequently, Mr. Caldwell left a telephone message for the Examiner the morning of April 6, 2004 in an attempt to discuss the case. Around noon, the Examiner called Steve Caldwell to discuss the application but was told that a response was already submitted due to the deadline.

In the response, Applicant noted that the Examiner's response that "even if the elastically deformable pins of Zhu are not easily detachable or even if it was not desirable to detach these pins from the circuit board, it is believed that the

Art Unit: 2841

claim language is met, as these pins are detachable" is not proper reasoning for a 102 analysis. While the above-mentioned response was a misstatement, it was not actually made in the 103 rejection, but in response to Applicant's argument that even if the retention mechanism disclosed by Zhu were easily removed, the brazing material would be scraped from the surface of the holes. It is noted that Zhu shows that the retention mechanisms are detachable and also discloses that the engagement of the retention mechanisms inside the holes are resilient (column 3, lines 1-3). Furthermore, Zhu teaches that the retention mechanisms do not extend below the surface of the circuit board so that the brazing material would not be scraped. This reference is relied upon for the disclosure of these features. Claims 39, 41-46 did not preclude the use of a brazing or solder material to coat the holes.

In his response, Applicant further states that it was not shown in the rejection that it would be obvious to modify Hayes' antenna structure with the connection structure to obtain detachable ground and signal feeds. In the rejection, Hayes was used to show a known antenna structure permanently attached to a board. Zhu was used to modify the base Hayes reference to show that it is known to resiliently and detachable connect a component a circuit board and is relied upon for this teaching of the connection. While Applicant states that Zhu's engaging means are not designed to be detachably inserted into the circuit board, it is clear from the reference that the engaging means are detachably inserted. It is then mentioned again that Zhu's solder connected engaging means would scrape brazing material from the inner surfaces of the holes of the

circuit board to have negative effects on the mechanical and electrical connection between the component and the board. However, as noted above, Zhu teaches that the engaging means are specifically designed so as to not scrape the solder to maintain a reliable connection. It is believed that Zhu teaches a detachable connection and has an objective of making such connection so as to not degrade the connection. Therefore, the rejection is maintained.

Regarding new claim 47, Applicant's arguments have been fully considered and a new ground of rejection is made in view of Jones.

Conclusion

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong T. Vu whose telephone number is

Art Unit: 2841

(571) 272-2111. The examiner can normally be reached on Mon. & Tues., 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David S. Martin can be reached on (571) 272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PTVu
Patent Examiner

